

**REMARKS**

Favorable reconsideration of the above-identified application, as amended, is respectfully requested.

Claims 3, 6-11 and 18-19 are pending in this application. Claim 5 is canceled herein. Claims 6-7 and 9 are amended herein. Claim 19 is newly added herein. No claims have been allowed.

The drawings stand objected to under 37 C.F.R. 1.83(a) as not showing every feature of the claims.

In that regard, the Examiner in particular asserts that applicant's feature in claim 7 of a 90-deg meta-stable alignment state for a liquid crystal (LC) material is not shown in applicant's drawings.

In response, applicant has amended paragraph 0022 accordingly, to indicate a particular disposition of a liquid crystal material that applicant intends as representative of a 90-deg meta-stable alignment state for the liquid crystal material in accordance with applicant's invention. Support for this amendment to paragraph 0022 is found, implicitly or inherently if not explicitly, in paragraph 0022 and 0023 (i.e., paragraph 0022 and 0023 teach liquid crystal alignment either parallel or perpendicular to grooves of a grooved substrate, where such a perpendicular liquid crystal alignment is implicitly or inherently if not explicitly understood by a person skilled in the art as a 90-deg meta-stable alignment state of the liquid crystal material).

Applicant also wishes to bring the Examiner's attention to U.S. Patent No. 6,573,971, that uses a "degrees metastable twist" terminology generally analogous to applicant's 90-deg meta-stable terminology, as representative of liquid crystal display terminology in common use at the time of applicant's invention.

In light of the foregoing response, applicant believes that in fact applicant's 90-deg meta-stable alignment state is shown in applicant's drawings as most recently supplemented, but not adequately designated or described in applicant's specification. Since applicant submits that applicant's specification has now been properly amended to at minimum more clearly explicitly describe that which applicant asserts as implicit or inherent if not somewhat less explicit within applicant's specification with respect to a 90-deg meta-stable alignment state, applicant respectfully requests that the Examiner's objection to applicant's drawings be withdrawn.

Claims 5-7 and 18 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A first portion of the foregoing rejection derives from an alleged inadequate antecedent correspondence between claim 5 and claim 7. To address this particular first portion of the foregoing rejection, applicant has canceled claim 5.

A second portion of the foregoing rejection derives with respect to claim 6 to an alleged inadequacy in description of how applicant's invention provides increased surface anchoring energy in comparison with an LCD device including only flat substrates, that applicant has not otherwise illustrated.

In response in a first instance to this second portion of the foregoing rejection, applicant observes that applicant's invention is not currently claimed using only flat substrates, and for that reason, absence of illustration of an LCD device structure using two flat substrates does not violate 35 U.S.C. 112, second paragraph, since two flat substrates is not "the subject matter which applicant [currently] regards as the invention."

In response in a second instance to this second portion of the foregoing rejection, applicant has amended claim 6 accordingly to provide that applicant's surface anchoring energy increase is related to a surface contact area increase of a liquid crystal material and a grooved substrate (i.e., in comparison with a flat substrate) as is supported by paragraph 0013.

A final portion of the foregoing claims rejection derives with respect to claim 7 to an alleged lack of clear recitation of how an increased alignment force is generated with respect to applicant's claimed liquid crystal material.

In response, while applicant questions whether within a structure claim there necessarily exists a requirement for a clear disclosure of how a particular structural feature operates, applicant has nonetheless amended claim 7 accordingly, and in concert with paragraph 0013, to recite that applicant's increased alignment force derives from a "topographic un-symmetry so that alignment of applicant's liquid crystal material other than along applicant's grooves is energetically unfavorable."

In light of the foregoing responses, applicant respectfully requests that the Examiner's rejections of claims 5-7 and 18 under 35 U.S.C. 112, second paragraph, be withdrawn.

Claims 5, 7, 9-11 and 18 stand rejected under 35 U.S.C. 102(b) as being anticipated by Sugawara et al. (U.S. Patent No. 5,435,421; hereinafter "Sugawara").

Claims 3 and 6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Sugawara in view of Callegari et al. (U.S. Patent No. 6,020,946; hereinafter "Callegari").

As an initial consideration, "[a] claim is anticipated only if each and every element set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP 2131 (citing *Verdegaal Bros. v. Union Oil of California* (citation omitted)).

Thus, anticipation under 35 U.S.C. 102 requires a clear disclosure within a single prior art reference of all limitations or elements of an applicant's claimed invention.

In addition, for an Examiner to properly reject an applicant's claims to the applicant's invention under 35 U.S.C. 103 over a single prior art reference or a combination of prior art references, a *prima facie* case of obviousness must be established with respect to the single prior art reference, or the combination of prior art references. The *prima facie* case of obviousness includes three criteria, as follows: (1) a suggestion or motivation to modify or combine the reference or references; (2) a reasonable expectation of success that the reference or references when modified or combined will provide the applicant's claimed invention; and (3) a consideration that the prior art reference or references when combined teach or suggest all of the applicant's claim limitations. MPEP 2142, 2143.

The Examiner asserts that all limitations of applicant's claim 7 are taught within Sugawara (i.e., absent specific citations to appropriate locations within Sugawara where particular elements of applicant's claimed invention are taught), but for, at minimum, a teaching of: (1) elimination of a 90-deg meta-stable alignment state for applicant's liquid crystal material with respect to applicant's grooved substrate, and (2) an increased alignment force for constraining applicant's liquid crystal material to applicant's grooved substrate. The Examiner asserts that each of the foregoing two limitations of applicant's invention as recited in claim 7 is an "inherent physical property" of applicant's invention.

In comparison with respect to Suragawa, and further with respect to elimination of a 90-deg meta-stable alignment state of Suragawa's liquid crystal material with respect to Suragawa's grooved substrate, applicant observes that Suragawa, at the cover figure and also at the abstract, teaches a grooved LCD substrate that comprises both an irregular pattern in a first direction and

an irregular and asymmetric pattern in a second direction perpendicular to the first direction. With respect to 90-deg meta-stable alignment states, applicant asserts that a person of ordinary skill in the art would understand that Suragawa's grooved LCD substrate would not provide for elimination of a 90-deg meta-stable alignment state as an "inherent physical property," since Sugawara's irregular and asymmetric second pattern in the second direction perpendicular the first direction would provide a 90-deg meta-stable alignment state trap under circumstances where a liquid crystal material aligns in the irregular and asymmetric pattern in the second direction perpendicular to the first direction. In particular, the ridges and the troughs within the irregular and asymmetric second pattern perpendicular to the first pattern will tend to restrict a 90-deg meta-stable alignment state aligned liquid crystal material from relaxing to an aligned state in a groove within the irregular pattern in the first direction of Suragawa's grooved LCD substrate.

In addition, and in response with respect to applicant's increased alignment force due to a liquid crystal material staying in a groove, as claimed in claim 7, applicant observes that Suragawa at col. 6, lines 29-33 teaches that Suragawa's particular grooved LCD substrate structure is intended to provide a liquid crystal material that has a pre-tilt angle and is thus deliberately at least in-part not in a groove of Suragawa's particular grooved LCD substrate structure.

In further comparison, Callegari, at minimum at the cover figure, does not teach a grooved LCD substrate, and for that reason Callegari clearly is also unable to teach either: (1) a 90-deg meta-stable alignment state for a liquid crystal material with respect to a groove within a grooved LCD substrate; or (2) an increased alignment force for the liquid crystal material within

the grooved LCD substrate due to the liquid crystal material staying in the groove within the grooved LCD substrate.

Thus, since each and every limitation within applicant's invention as recited in claim 7 is not taught within Suragawa or Callegari individually, nor therefore a combination of Suragawa and Callegari, (i.e., with respect to elimination of a 90-deg meta-stable alignment state of a liquid crystal material with respect to a groove within a grooved LCD substrate or an increased alignment force of the liquid crystal material with respect to the groove within the grooved LCD substrate), applicant asserts that claim 7, and the claims dependent thereupon within this application, may not properly be rejected under 35 U.S.C. 102(b) as being anticipated by Suragawa or under 35 U.S.C. 103(a) as being unpatentable over Suragawa in view of Callegari.

In light of the foregoing response, applicant respectfully requests that the above denominated claims rejections over Suragawa and/or Callegari be withdrawn.

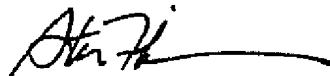
Applicant has amended claim 9 to provide that applicant's grooves within applicant's grooved LCD substrate are in a single direction only. Claim 9 is supported by paragraph 0021 as newly amended, that in-turn finds further support in FIG. 2, as originally filed.

Applicant has also newly added claim 19. Claim 19 derives from claim 7, but includes only the 90-deg meta-stable state alignment elimination limitation that the Examiner asserts as an inherent physical property of Sugawara (i.e., and not any of the other limitations of claim 7 that the Examiner asserts as inherent physical properties of Suragawa).

Applicant requests specific and independent consideration of amended claim 9, as dependent upon claim 7. Applicant also requests specific and independent consideration of newly added claim 19, as is fully independent of claim 7.

In light of the foregoing remarks, applicant respectfully requests reconsideration of, and early allowance of, the claims pending within this application.

Respectfully submitted,



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